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**DEVICE FOR PLANTING WATER PLANTS**

[Vorrichtung zum Einpflanzen von Wasserpflanzen]

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## Description

The invention relates to a device for planting water plants into the ground beneath the water surface.

The invention also relates to a method for planting water plants into the ground beneath the water surface.

Water plants, which for example are supposed to be planted in the bottom of an aquarium, can be divided into the group of the stem plants, these are planted as cuttings without roots, and into the group of plants that are rooted in the soil. For planting the stem plant for instance, an accordingly deep hole is bored with the finger, and then the plant is inserted and pressed in on the side. The plants that are rooted in the soil are planted by digging more or less deep holes in the sand, and then the plants are put in the ground while protected by the thumb and index finger, and the soil is pressed on and the roots are lightly covered.

However, this seemingly simple planting process proves to be extremely difficult since the more or less strong upward move the water plants counteracts their anchoring, and the plants can

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<sup>1</sup> Numbers in the margin indicate pagination in the foreign text.

loosen in the ground. Furthermore fish that rummage in the ground dig out poorly rooted plants. If the surfaces of stem plants or existing roots of the other types are damaged while planting them into the ground, these injuries can lead to rotting of the stem and roots. Therefore the rooting of the plants is hindered. If on the other hand the rooted water plants are planted too deep in order to achieve efficient anchoring, the plants show disturbed growth and foliate none or only few leaves.

Also, the planting hole that was dug in the ground is being flooded by the water immediately even before inserting the plant. At specialized dealers where non-planted water plants are available for sale, these plants have to be held down to the ground by weights. Therefore on stem plants, for example, a lead band is wrapped around the root end, wherein this end is supposed to be protected from damage incurred by the lead wire through a foamed tie. This marketing aid, which saves the middlemen the planting process, is however not suited for the permanent use and for planting. If the water plant is planted with this so-called marketing aid, the rotting of the water plant is to be expected.

Rooted water plants are often offered in baskets made out of plastic and filled with rock wool or foamed material, in which they were cultivated. These baskets also have to be removed before planting.

It is therefore the object of the present invention to create a device for planting water plants, which makes planting easier and

promotes secure anchoring in the ground located beneath the water surface.

This object is resolved according to the invention in that it is designed as a basic body encompassing the water plant in its root area, which consists of a water-permeable foam material block and with its outer surface facing away from the water plant can be fixed in the water bed.

The basic body advantageously consists of a water-permeable foam material block, which protects the intended root area of the stem plant or the root area of the rooted plant, and allows nutrients to penetrate, and which due to its larger volume can be fixed in the ground more easily than the mere plant.

Another object the present invention is to improve a method for planting water plants of the above-mentioned kind in such a way that planting is made easier and inadequate or incorrect fixation in the ground is avoided.

This object is resolved according to the invention in that a basic body made out of water-permeable foam material surrounds the water plants in the root area, with which they are fixed in the ground.

Through the basic body, which is made out of water-permeable foam material, the root area of the water plant can be reliably protected with this method, and it is possible to fix the plant securely underneath the water surface in the ground with only one hand, even with unfavorable visibility. The method according to

the invention can advantageously be used by the adolescent beginner, as well as by the advanced adult aquarium owner. Furthermore, this method can also be used for water plants that are supposed to be planted in a pond.

The invented device can for instance already be attached by the wholesaler and can serve as a marketing aid also for the middlemen when weighed down with a weight, and it can then be directly planted in the ground with the root area of the plant by the end user, after removing the weight.

According to a preferred embodiment, the basic body consists of a one-piece foam material block, on which a tension element made of deformable coated wire is attached with one end. The foam material block can for instance be placed around the future root area of a stem plant in such a way and be surrounded by the free end of the wire on its circumferential surface such that the circular arched wire tightens the foam material block to the plant.

According to another preferred embodiment of the invention, the foam material block consists of two parts, which are placed around the root area of the plant and are tightened to the plant by a rubber ring, which is placed over its circumference. This embodiment can advantageously be fixed to the rooted areas of rooting water plants.

According to another preferred embodiment, the foam material block is developed as a bag, which encloses the inner space and

has an opening that opens in the inner space. In this bag advantageously not yet cultivated small water plants can be inserted with their root areas with plant soil into the inner space and can later be planted with the bag. However, it is also possible to remove this bag after the cultivation period and replace it with another embodiment of the foam material block. Further details of the invention result from the following detailed description and the attached drawings, in which the preferred embodiments /2<sup>1</sup>

of the invention are illustrated as examples.

In the drawings are shown:

Fig. 1 Side view of a water plant with the device for planting cut lengthwise,

Fig. 2 top view of a device for planting with tension element,

Fig. 3 side view of the device of Fig. 2,

Fig. 4 top view of a device surrounding a water plant according to Fig. 2,

Fig. 5 top view of another device for planting water plants,

Fig. 6. top view of another embodiment of a device for planting water plants,

Fig. 7 side view of another embodiment of a device for planting water plants,

Fig. 8 side view of a water plant surrounded by the device according to Fig. 7,

Fig. 9 top view of another embodiment of a device for planting,

Fig. 10 side view of another device for planting with a two-piece basic body,

Fig. 11 view from below of the device of Fig. 10,

Fig. 12 side view of the device arranged in the root area of a plant of Fig. 10,

Fig. 13 front view of another embodiment of a device for planting water plants,

Fig. 14 side view of the device of Fig. 13,

Fig. 15 top view of the device of Fig. 13,

Fig. 16 front view of another embodiment of a device for planting water plants,

Fig. 17 side view of the device of Fig. 16, and

Fig. 18 top view to the device of Fig. 16.

A device (5) for planting water plants (1) into a ground (3) located beneath a water surface (2), for example an aquarium (4), consists of a basic body (6), which encompasses the water plant in its root area (7) and depending on the embodiment is held by a tension element (8). The basic body (6) consists of a water-permeable elastic foam material block (9) made of reticulated, open-cell, porous material.

Fig. 2 to 4 show a device (5), the foam material block (9) of which is designed as a cylindrical section (10). The cylindrical section (9) is delimited in its longitudinal direction by



opposing end surfaces (32), which have the shape of circular sections. The cutting lines of the end surfaces (32) together with the cutting lines of a cylinder casing (14) delimit a cut surface (11), the opposing ends (12, 13) of which are delimited by cutting lines of the cylinder casing (14) extending in the longitudinal direction of the cylindrical section (10). This device is especially suited for planting water plants consisting of non-rooted cuttings of all stem plants.

Fig. 5 shows a device (5), the foam material block (9) of which is designed as a cylindrical element (15). The cylindrical segment (15) is delimited in its longitudinal direction by opposing end surfaces (32), which have the shape of circular segments with a segment angle ( $\alpha$ ) of more than  $180^\circ$ . Due to the segment-shaped cut, this embodiment of the foam material block (9) can be placed easily around the root area of all poorly rooted young plants without damaging it.

According to another beneficial embodiment (see Fig. 6), the foam material block (9) is designed as the section (16) of a hollow cylinder, which in its longitudinal direction is delimited by opposing end surfaces (32), which take on the shape of circular ring sections. Due to central design (17), the root area of poorly rooted young plants is protected better before applying the device on the plant (1).

Another embodiment of a device (5) is illustrated in Fig. 7. The foam material block (9) is designed as a hollow cylinder (18) and

comprises a central bore (19). The bore (19) allows the foam material block (9) to be pulled easily over the future root area (7) of non-rooted cuttings of all stem plants.

Due to the radial cut (20), which opens the cylinder casing (14) in the longitudinal direction, the hollow cylinder (18) can be placed as an open ring cylinder laterally over the root area (7) of the water plant (1). This has the advantage that the device (5) can also be used for all poorly rooted young plants.

Figs. 10 to 11 show another beneficial embodiment of a device (5), in which the foam material block (9) is designed as a hollow cylinder, which is divided into two semi-shells (21) by a continuous cut in its longitudinal direction. The semi-shells (21) are delimited in their longitudinal direction by opposing end surfaces (32). The two semi-shells (21) each comprise on their end surface (32) facing the ground (3) a radial cut (23), which divides them in this area into two quarter segments (22), which on their ends facing away from the ground (3) transition into the semi-shell (21). The two semi-shells (21) can beneficially also be placed over the root area (7) of water plants (1) with stronger roots and there be fixed by a rubber ring (24).

Figs. 13 to 15 illustrate another beneficial embodiment of the device (5). The foam material block (9) is designed as an elongated block, which in its longitudinal direction is delimited by a base surface (25) and an opposing end surface (26). The end

surface (26) comprises a cut (27) extending in the direction of the base surface so that the part of the block (9) facing the end surface (26) is divided into two parts in the area of the cut. The base surface (28) comprises a cut (28) extending in the direction of the end surface (26), which is offset by about 90 degrees from the cut (27) of the end surface (26). The two cuts (27, 28) run into each other so that a passage is formed by the cuts (27, 28) in the longitudinal direction of the block (9). This embodiment has the advantage that here a tension element can be foregone.

Figs. 16 to 18 show another beneficial embodiment of the invention. A bag (29) comprises on its top (31) a slot-shaped opening (30), which taps the interior space enclosed by the bag.

Through this opening beneficially the root area (7) of 3<sup>1</sup> small water plants (1) can be inserted with planting soil into the interior space of the bag (29). This device (5) is also suited for cultivating water plants (1).

When planting a stem plant, a basic body (6) consisting of water-permeable foam material, which is designed for example as an elongated block (9) with cuts (27, 28) that form a passage in their transition areas, can be placed in the expanded state on the root area (7) of the water plant (1). Due to the elasticity of the foam, the block (9) adheres to the root area (7) of the water plant (1) and can be inserted into a ground (3) located beneath a water surface (2) without difficulty using swinging or

rotating motions. The ground, which can be pressed on slightly, supports the fixation of the water plant (1) in the basic body (6).

A foam material block (9), which is designed for example as a cylinder segment (15) or a section (16) of a hollow cylinder, is beneficially placed around the root area (7) of stem plants or poorly rooted young plants, wherein said block is pressed on such that the two section surfaces (11) come into contact with each other and the foam material block (9) is fixed in its position by a tension element (8), which is bent in a ring-shaped manner around the cylinder casing (14). Subsequently the water plant (1) is anchored in the ground (3) by burying the foam material block (9).

In the case of water plants (1) with roots, beneficially two semi-shells (21) of a foam material block (9) are placed around the root area (7) of the water plant (1) such that the section surfaces (11) of the semi-shells (21) come into contact with each other. In this position the foam material block (9) is fixed on the water plant (1) by means of a rubber ring (24) that is slid over its cylinder casing (14). The water plant (1) is then anchored in the ground (3) with the foam material block (9) while preserving the root area (7).

Very small plants, which are supposed to be cultivated prior to being planted, are inserted into a foam material block (9) designed as a bag (29) together with planting soil through its

opening (30) and are anchored in the ground (3) together with the foam material block (9). When the plants have reached such a size that a foam material block (9), which is designed e.g. as a cylinder segment (15) can be fixed to them, the bag (29) is cut open, the plant is freed from the planting soil and it is anchored again in the ground (3) with the cylinder segment (15) that has been placed around it. It is, however, also feasible to leave the plant in the bag (29).

#### Patent Claims

1. Device for planting water plants in a ground beneath the water surface, **characterized in that** it is designed as a basic body (6) that surrounds the water plant (1) in its root area (7), which consists of a water-permeable foam material block (9) and is fixable in the ground (3) with its outer surface facing away from the water plant (1).
2. Device according to claim 1, characterized in that the foam material block (9) consists of an elastic material.
3. Device according to claim 1 or 2, characterized in that the foam material block (9) consists of an open-cell material.
4. Device according to one of the claims 1 to 3, characterized in that the foam material block (9) consists of a porous material.

5. Device according to one of the claims 1 to 4, characterized in that the porous material has a porosity between 10 and 40 ppi.
6. Device according to one of the claims 1 to 5, characterized in that the foam material block (9) consists of a polyether foam material.
7. Device according to one of the claims 1 to 5, characterized in that the foam material block (9) consists of a polyester foam material.
8. Device according to one of the claims 1 to 7, characterized in that the basic body (6) is fresh water-permeable.
9. Device according to one of the claims 1 to 8, characterized in that the basic body (6) is salt water-permeable.
10. Device according to one of the claims 1 to 9, characterized in that the basic body (6) consists of non-toxic material.
11. Device according to one of the claims 1 to 10, characterized in that the basic body (6) is fixable to the water plant (1) with a tension element (8).
12. Device according to claim 11, characterized in that the tension element (8) consists of a deformable material.
13. Device according to claim 11 or 12, characterized in that the tension element (8) consists of a wire.
14. Device according to claim 12 or 13, characterized in that the deformable material is rust-free.
15. Device according to one of the claims 11 to 14, characterized in that the tension element (8) is coated.

16. Device according to one of the claims 11 to 15, characterized in that the tension element (8) is attached to the basic body (6) with one end.

17. Device according to claim 11, characterized in that the tension element (8) is designed as an elastic ring.

18. Device according to claim 17, characterized in that the elastic ring consists of rubber.

19. Device according to one of the claims 1 to 18, characterized in that the foam material block (9) is designed as a cylinder section (10), of which the opposing end surfaces (32) have the shape of circular sections, whose cutting lines together with the cutting lines of the cylinder casing (14) delimit a cut surface (11), which can be placed around the root area (7) of the water plant (1) in such a way that the two opposing ends (12, 13) of the cut surface (11) formed by the cutting lines of the cylinder casing (14) come into contact with each other.

20. Device according to one of the claims 1 to 18, characterized in that the foam material block (9) is basically designed as a cylinder segment (15), of which the opposing end surfaces (32) have the form of circular segments, the cutting lines of which form a segment angle ( $\alpha$ ) of more than 180 degrees and  $\frac{1}{4}$  together with the cut lines of the cylinder casing (14) delimit cut surfaces (11) that can be placed around the root area (7) of the water plant (1) in such a way that the two ends (12, 13) of

the cut surfaces (11) formed by the cutting lines of the cylinder casing (14) come into contact with each other.

21. Device according to one of the claims 1 to 18, characterized in that the foam material block (9) is basically designed as a section (16) of a hollow cylinder, of which the opposing end surfaces (32) have the form of circular ring sections, of which the cutting lines together with the cutting lines of the cylinder casing (14) delimit cut surfaces (11) that can be placed around the root area (7) of the water plant (1) in such a way that the cut surfaces (11) come into contact with each other.

22. Device according to one of the claims 1 to 18, characterized in that the foam material block (9) is basically designed as a section (16) of a hollow cylinder, of which the opposing end surfaces (32) have the form of circular ring sections, of which the cutting lines together with the cutting lines of the cylinder casing (14) delimit cut surfaces (11) that can be placed around the root area (7) of the water plant (1) in such a way that the cut surfaces (11) come into contact with each other.

23. Device according to one of the claims 1 to 18, characterized in that the foam material block (9) is designed as a hollow cylinder (18), which is permeated by a bore hole (19) that can be slid over the root area (7) of the water plant (1).

24. Device according to claim 23, characterized in that the hollow cylinder (18) has a lateral radial cut (20), which divides the cylinder casing (14) on its length delimited by the end



surfaces (32) such that the hollow cylinder (18) can laterally be placed over the root area (7) of the water plant (1), as an open ring cylinder.

25. Device according to one of the claims 1 to 18, characterized in that the foam material block (9) is designed as a hollow cylinder (18), which is divided by a longitudinal cut into two semi-shells (21) with two cut surfaces (11) each such that the two semi-shells (21) can be placed on the root area (7) of the water plant (1) such that their cut surfaces (11) come into contact with each other.

26. Device according to claim 25, characterized in that both of the two semi-shells (21) comprise a radial cut (23) when viewed from an end surface (32) facing the ground (3), so that as a result of each cut (23) two quarter segments (22) are generated, which transition into the semi-shells (21) with the ends that face away from the ground (3).

27. Device according to one of the claims 1 to 18, characterized in that the foam material block (9) is basically designed as an elongated block, which is delimited in the longitudinal direction by a base surface (25) and an end surface (26) that is located on the opposite side thereto, and whose end surface (26) has a cut (27) extending in the direction of the base surface (25) so that the part of the block (9) facing the end surface (26) is divided into two parts as a result of the cut, and whose base surface (25) comprises a cut (28) that is offset by about 90 degrees in

the direction of the end surface (26), wherein both cuts (27, 28) run into each other on the inside of the block (9) so that a passage forms in the longitudinal direction of the block (9), through which the root area (7) of the water plant (1) can be inserted.

28. Device according to claim 27, characterized in that the end surface (26) is smaller than the base surface (25).

29. Device according to claim 27 or 28, characterized in that the elongated block (9) is designed as a frustum.

30. Device according to one of the claims 1 to 18, characterized in that the foam material block (9) is designed as a bag (29), which encloses the inner space and has an opening (30) that opens in the inner space, through which a water plant (1) with its root area (7) and planting soil can be inserted into the inner space.

31. Device according to claim 30, characterized in that the opening (30) that opens in the inner space is developed in the form of a slot.

32. Method for planting water plants in a ground that is located beneath the water surface, characterized in that the water plants (1) are enclosed in the root area (7) by a basic body (6) that is made out of water-permeable foamed material, with which they are fixed in the ground (3).

33. Method according to claim 32, characterized in that the basic body (6) in the expanded state is placed onto the root area

(7) of the water plant (1) and adheres to it due to its elasticity.

34. Method according to claim 32, characterized in that the basic body (6) is fixed in the root area (7) of the water plant (1) through a tension element (8).

35. Method according to claim 32, characterized in that the root area (7) of the water plant (1) together with the planting soil is inserted into the basic body (6) designed as a bag (29) through its opening (30).

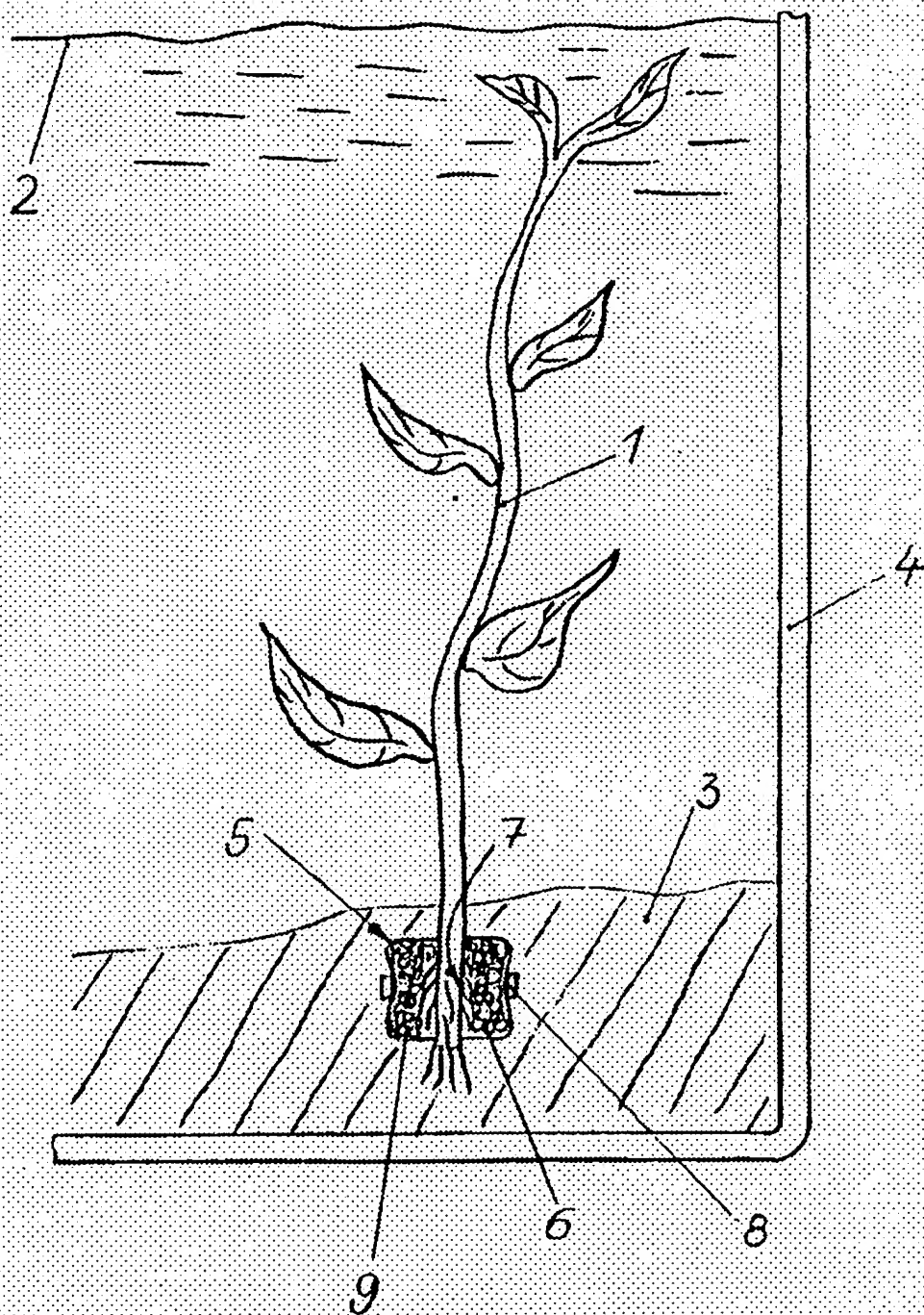
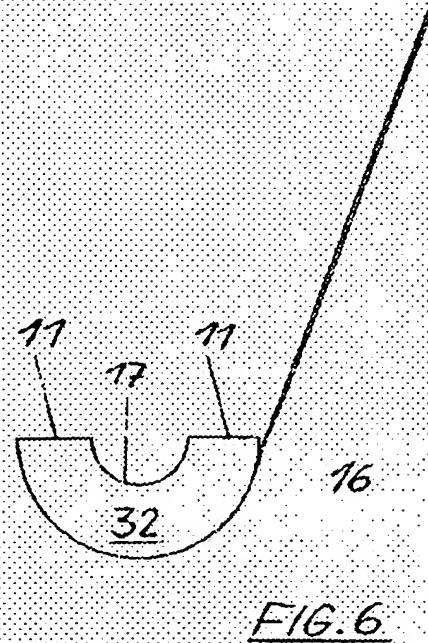
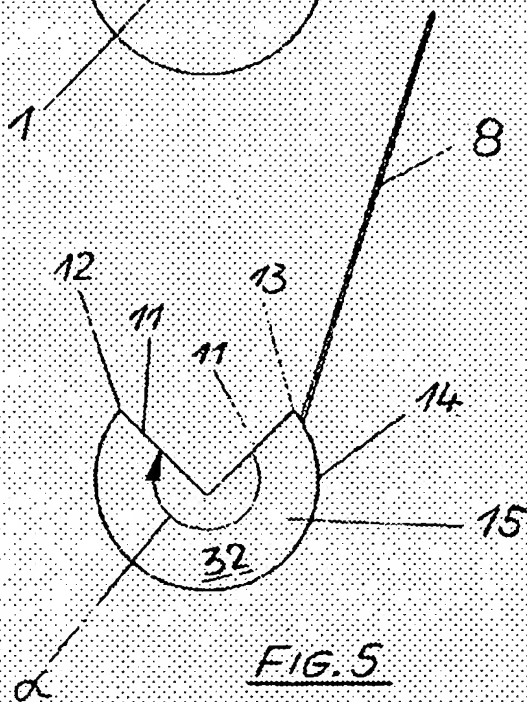
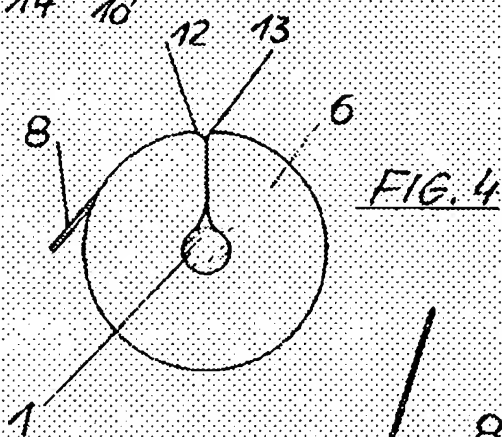
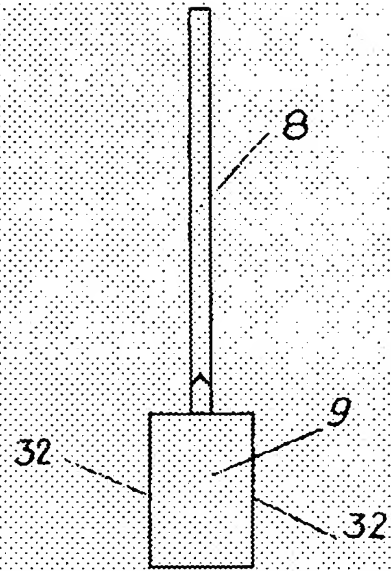
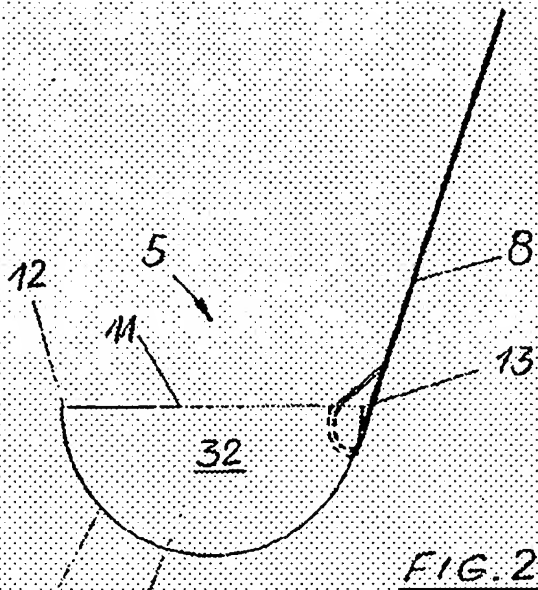


FIG. 1



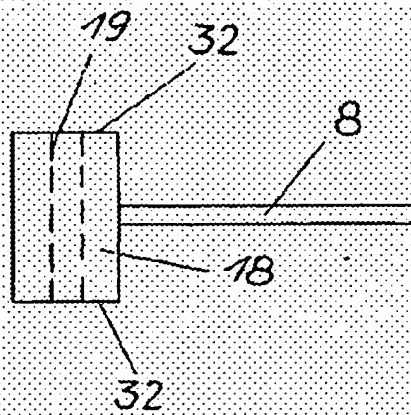


FIG. 7

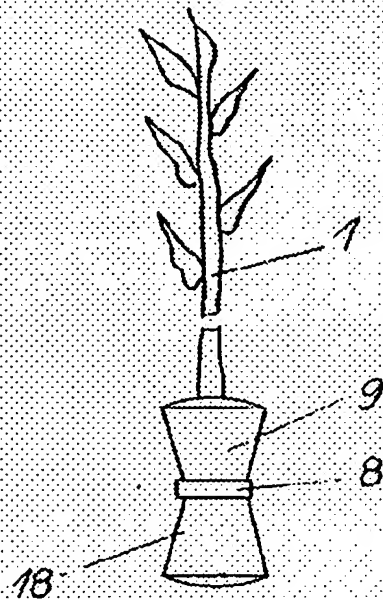


FIG. 8

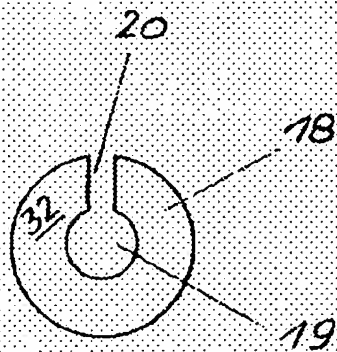


FIG. 9

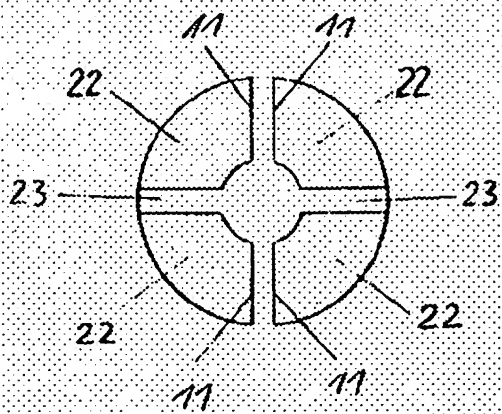
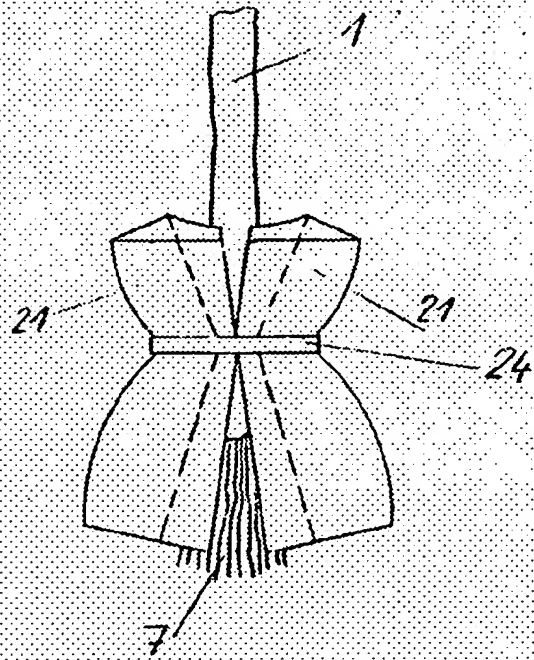
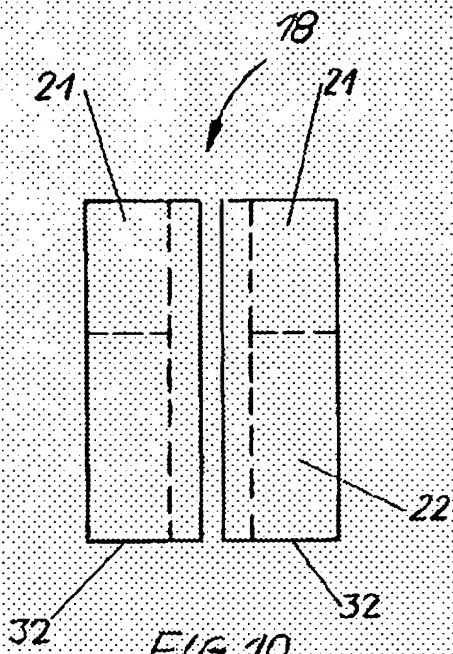


FIG. 11

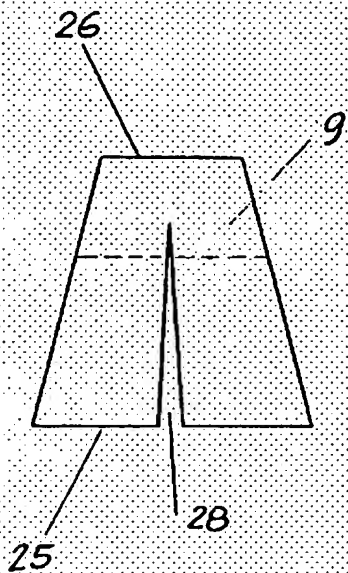


FIG. 13

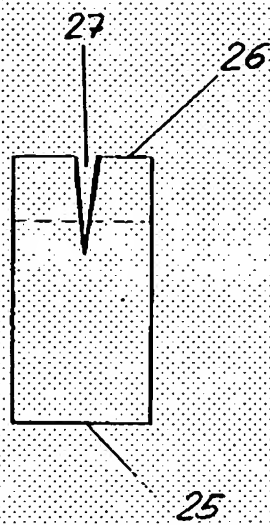


FIG. 14

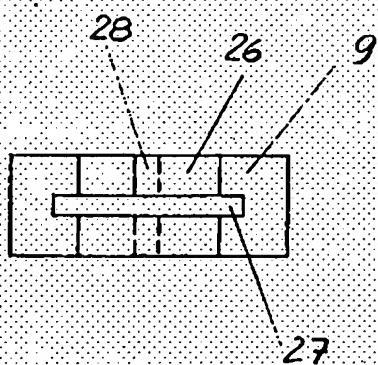


FIG. 15



FIG. 16

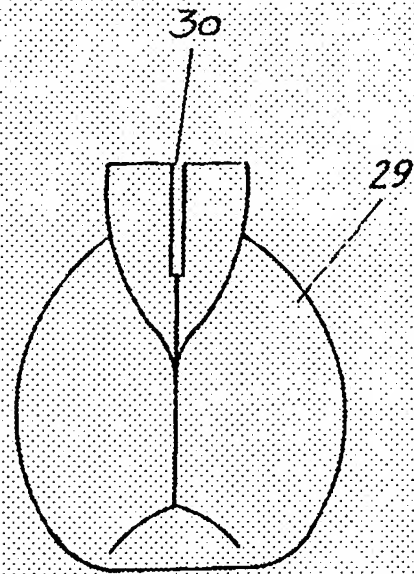
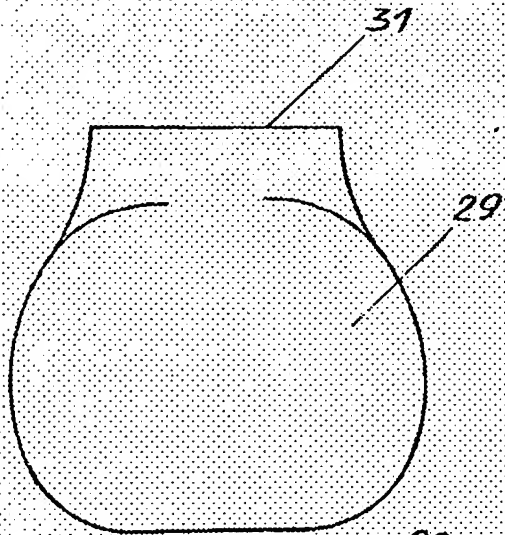


FIG. 17

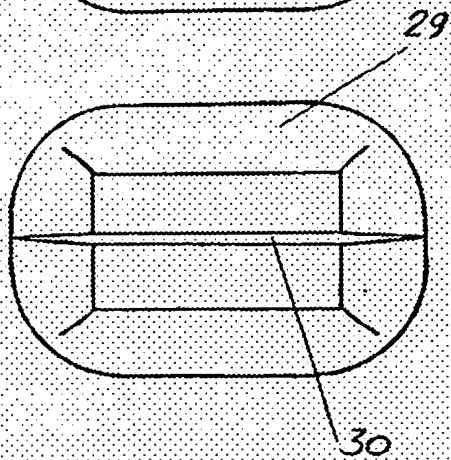


FIG. 18